2005 and April 2009 and were diagnosed by the rheumatologist with primary hand, knee or hip OA.
All subjects were followed until 2 November 2011. Mortality was compared between included patients with OA and the general population in the Netherlands, matched for both age and gender. For GARP, the expected numbers of deaths came from age and gender specific mortality data provided in the mortality statistics from 2006 in 5-year age bands and for 'Zorgpad artrose' the data came from 2009. Standardized Mortality Ratios (SMR) with 95% confidence intervals (95% CI) were calculated using STATA (version 10.1).
Results: The GARP study consisted of 384 participants (82% women) and the mean age at inclusion was 60.1 (range 42-79). The duration of follow-up was 9.0 (SD 1.2). No excess mortality was observed in OA patients when compared to the general population. 26 patients died, while the expected number of deaths was 48 (SMR 0.54, 95% CI 0.37 - 0.79). The SMR was 0.47 (0.29 - 0.76) in women and 0.73 (0.39 - 1.35) in men. Healthy cohort effect was also tested and not likely present.
In our replication cohort we found similar results (11 patients died, SMR 0.45, 95% CI 0.25 - 0.82). The SMR was also lower in women (0.40, 0.20 - 0.81) than in men (0.66, 0.21 - 2.06)
Conclusions: In patients consulting health care, OA does not lead to a higher mortality rate in women and a similar trend can be observed in men. These results do not support the hypothesis that metabolic syndrome is an important cause of OA and would influence the mortality of patients consulting primary or secondary health care for their complaints. Whether this is due to selection of patients or reflects a true absence of metabolic syndrome in OA has to be further investigated.

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THE ASSOCIATION OF STATIN USE AND INCIDENT RADIOGRAPHIC KNEE OSTEOARTHRITIS

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Purpose: Statin medications are widely used and have been shown to reduce inflammation in cardiovascular disease; animal data suggests a protective role for statins in inflammation associated with cartilage and bone. Based on these findings, we wanted to evaluate the association of statin use with the risk of incident knee radiographic osteoarthritis (ROA).
Methods: Subjects were enrolled in MOST, an NIH-funded cohort study of 3026 men and women ages 50-79 years with, or at high risk of knee OA. Subjects had baseline and 30 month follow-up PA and lateral knee x-rays. Tibiofemoral (TF) ROA was defined as the presence of Kellgren/Lawrence (K/L) grade $\geq$ 2. Whole knee (WK) ROA was defined as the presence of either TFROA or patellofemoral (PF) OA, defined as either (1) PF osteophyte grade $\geq$ 2, or 2) as a PF osteophyte grade $\geq$ 1 plus one or more of PF joint space narrowing, sclerosis or cysts . Incident cases were knees without TFROA (or WKROA) at baseline that developed it at 30 months. Statin use was determined by a review of current (past 30 days) prescription medications, brought to the clinic by participants, at the baseline and 30 month visits. We used logistic regression in a knee based analysis, with GEE to account for within-person correlation, to determine the association of statin use at both the baseline and 30 month visit ("continuous use") compared to no statin use at either the baseline or 30 month visit ("no use") with outcomes of incident TFROA and incident WKROA. Analyses were adjusted for age, race, clinic site, BMI and self-reported cardiovascular disease.
Results: 2,830 knees from 1,675 subjects were eligible for incident TFROA in subjects who had either "no use" (1,243 subjects) or "continuous use" (432 subjects) of statins over the 30 month period. There were no significant differences in baseline characteristics of the two statin use groups except for BMI ["no use"= 29.3 $\pm$ 5.3; "continuous use"=30.4 $\pm$ 5.1; p-value= 0.0006]. In men and women combined, there was no significant association between statin use and incident TFROA in the unadjusted model (OR=1.18 (0.85-1.63)), or after adjusting for covariates (OR= 1.13 (0.80-1.59)). Stratifying by gender suggested a different direction of association of statin use and TFROA in women compared to men [women: adjusted OR= 1.37 (0.88-2.15); p-value= 0.17; men: adjusted OR= 0.84 (0.51-1.41); p-value= 0.52); p-value for interaction by gender = 0.096]. All results, including stratified by gender, were similar for the outcome of incident WKROA.
Conclusions: We found no significant protective effect of statin use on the risk of incident knee ROA at 30 months, and can exclude a greater than 20% reduction in the odds of TFROA with 95% confidence. Because this is an observational study, residual confounding by indication may in part explain these results.

Association of Statin Use and Incident TFROA

	OVERALL		WOMEN		MEN	
	No use	Continuous use	No use	Continuous use	No use	Continuous use
Subjects	1243	432	764	196	479	236
Knees	1962	655	1208	287	754	368
Events	153 (7.3%)	60 (8.4%)	100 (7.7%)	37 (11.4%)	53 (6.6%)	23(5.9%)
Unadjusted model	ref	1.18 (0.85-1.63) 0.32	ref	1.57 (1.02-2.40) 0.04	ref	1.57(1.02-2.40) 0.04
Adjusted Model		1.13 (0.80-1.59) 0.49		1.37 (0.88-2.15) 0.16		0.84 (0.51-1.41) 0.52

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STAGED MEDIAL OPENING WEDGE HIGH TIBIAL OSTEOTOMY FOR BILATERAL VARUS GONARTHROSIS

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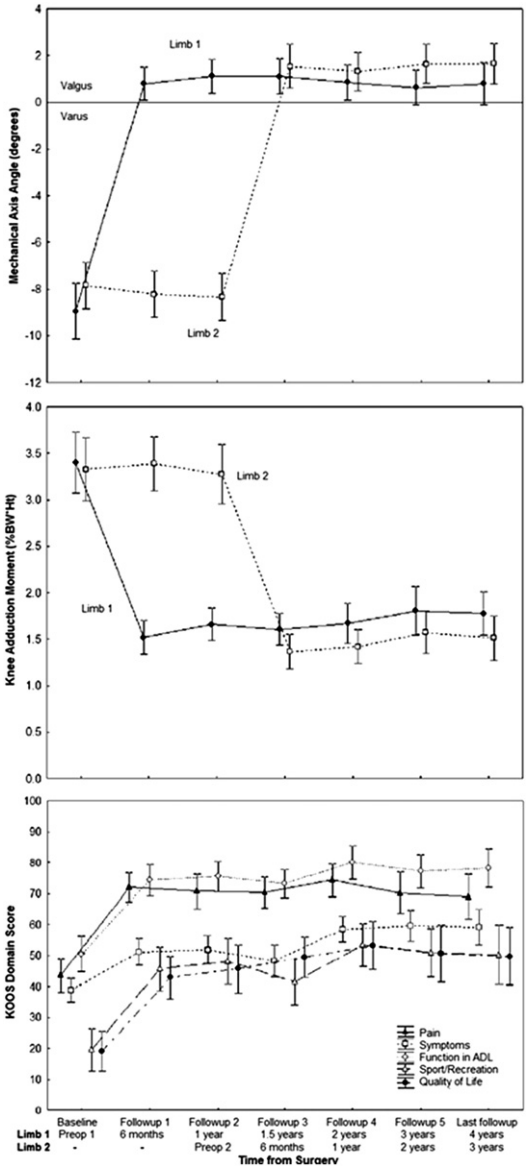
Purpose: Medial opening wedge high tibial osteotomy (HTO) aims to improve pain and function by correcting varus alignment and lessening aberrant loads on the medial compartment of the tibiofemoral joint. Because varus gonarthrosis often affects both knees, staged bilateral HTO may be an appropriate treatment approach for such patients. However, we are unaware of any previous studies evaluating outcomes after these staged procedures. Objectives of the present study were: 1) To evaluate changes in radiographic alignment, dynamic knee joint loading, patient-reported and performance-based outcomes after staged bilateral medial opening wedge HTO, and 2) To compare outcomes in patients having the second surgery staged either within or beyond 12 months of the first surgery.
Methods: Using a prospective case series design (level of evidence 4), 37 patients with bilateral varus alignment (-8.36° $\pm$ 2.98°) and medial compartment osteoarthritis (OA) underwent staged bilateral medial opening wedge HTO. Patients underwent full-limb standing anteroposterior radiographs to determine frontal plane alignment (mechanical axis angle) and 3-dimensional gait analysis to estimate knee joint loads

(external knee adduction moment). Patients also completed the Knee Injury and Osteoarthritis Outcomes Scores (KOOS), the Lower Extremity Functional Scale (LEFS), the Short Form Health Survey (SF-12) and the six-minute walk test (6MWT). Both limbs of all patients were evaluated preoperatively (baseline) and approximately 6, 12 and 24 months post-operatively after each surgery.

Results: There were large improvements in outcomes. Mean changes (95%CI) were: mechanical axis angle 9.43° (8.37, 10.39°); peak knee adduction moment -1.72 %BW*Ht (-2.06, -1.38 %BW*Ht); KOOS Pain 25.60 (19.76, 31.44); SF-12 Physical Component Summary 12.02 (8.50, 15.53); 6MWT 36.72 m (19.43, 54.01m). There were no statistically significant differences in the improvements at final assessment between those patients who had the second HTO staged either within or beyond 12 months of the first HTO.



Conclusions: Patients experience large, clinically important improvements in knee joint biomechanics, pain and function bilaterally after staged medial opening wedge HTO. Current findings suggest no difference in outcomes for patients who have the second surgery staged within or beyond 12 months of the first surgery.

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THE INFLUENCE OF AGE, STRENGTH AND STIFFNESS ON PROPRIOCEPTION IN KNEE OSTEOARTHRITIS

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Purpose: The perception of limb position in space requires the input signals from joint capsule mechanoreceptors, ligaments, muscle spindles and tendon receptors of the joint surrounding muscles. Proprioceptive accuracy and quadriceps weakness have been reported to be worse in patients with symptomatic knee osteoarthritis (OA) compared with asymptomatic one's, and pain is known to influence quadriceps strength. Reduction of joint mobility is consequence of decrease strength and also of joint stiffness, compromising joint position sense; therefore the aim of this study was to analyze the contributions of several variables in the knee proprioception.

Methods: From a cohort of 89 subjects, 52 (39 women; 13 men) were eligible and diagnosed for knee osteoarthritis according to ACR clinical and radiological criteria (K-L grade 2 or 3). Subjects had mean (SD) age 65.3 (8.2) yr, BMI 29.6 (5.5) kg/m^2, height 1.60 (0.07) m and weight 75.2 (13.5) kg. Joint position sense (JPS) was measured asking the subjects to reproduce three knee angles (20º, 45º, 70º) without visual control. Each position was repeated three times at random and accuracy was estimated by the difference between target and reproduced angles. Concentric knee extensor and flexion strength (peak torque) was assessed with a Biodex dynamometer at 60º/s, through a range of motion from 20º to 80º. Active knee joint range of motion was measured with a digital goniometer and degrees of maximal extension and flexion were recorded. Self-reported pain and joint stiffness were assessed by the Western Ontario and McMaster Universities Index (WOMAC). Pearson correlations between the quantitative variables were calculated. Flexor and extensor knee strength were highly correlated (r=0.880, p <0.001), therefore only the last one was chosen for the stepwise variable selection (p_{IN}=0.10; p_{OUT}=0.10). Multiple linear regression models were adjusted to find out which variables (extensor knee strength, knee flexion, knee extension, WOMAC pain and stiffness, and age) explain the JPS

Results: Table 1 shows the correlations between JPS and predictors. Two models emerged from two sets of variables which differ only in age predictor (Table 2 and 3). Despite the low proportion of variance explained by stiffness and knee extensor strength, these variables have a significant influence in JPS. When age was considered in the set of predictors, the knee extensor strength was not included in the model, probably due to the significant correlation between age and knee extensor strength (r=-0.332, p=0.016), and to the higher correlation of JPS with age (r=0.488, p<0.001) than with knee extensor strength (r=-0.164, p=0.245). The proportion of variance in the JPS explained by stiffness and age (R^2=0.306) was higher than the one achieved by model 1.

Conclusions: Proprioception and quadriceps muscle are fundamental to maintain joint stability under dynamic conditions. The results showed that age together with joint stiffness had more predictive value on joint position sense than quadriceps strength combined with joint stiffness in patients with knee OA.

Table 1
Pearson correlation coefficients between joint position sense and independent variables.

Independent variables	WOMAC pain	WOMAC stiffness	Knee flexion strength	Knee extensor strength	Knee flexion	Knee extension	Age
r	-0.077	-0.337	-0.146	-0.164	-0.037	0.006	0.488
p	0.586	0.014	0.301	0.245	0.795	0.966	< 0.001